


PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT
(PCT Article 36 and Rule 70)

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| Applicant's or agent's file reference P61401PC00 | | FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/PEA/416) | |
| International application No. PCT/NL 03/00599 | International filing date (day/month/year) 26.08.2003 | Priority date (day/month/year) 28.08.2002 | |
| International Patent Classification (IPC) or both national classification and IPC E21B17/01 | | | |
| Applicant LANKHORST SPECIAL MOULDINGS B.V. et al. | | | |
| <p>1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 6 sheets, including this cover sheet.</p> <p><input checked="" type="checkbox"/> This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).</p> <p>These annexes consist of a total of 3 sheets.</p> | | | |
| <p>3. This report contains indications relating to the following items:</p> <p>I <input checked="" type="checkbox"/> Basis of the opinion</p> <p>II <input type="checkbox"/> Priority</p> <p>III <input type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p>IV <input type="checkbox"/> Lack of unity of invention</p> <p>V <input checked="" type="checkbox"/> Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p>VI <input type="checkbox"/> Certain documents cited</p> <p>VII <input type="checkbox"/> Certain defects in the international application</p> <p>VIII <input type="checkbox"/> Certain observations on the international application</p> | | | |
| Date of submission of the demand 26.03.2004 | | Date of completion of this report 03.12.2004 | |
| Name and mailing address of the international preliminary examining authority:  European Patent Office - P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Tx: 31 651 epo nl Fax: +31 70 340 - 3016 | | Authorized Officer Rechenmacher, M Telephone No. +31 70 340-4085 | |



**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. **PCT/NL 03/00599**

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, Pages

1-11 as originally filed

Claims, Numbers

1-27 received on 10.11.2004 with letter of 10.11.2004

Drawings, Sheets

1/5-5/5 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:
- ☐ the drawings, sheets:

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5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).
(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

| | | |
|-------------------------------|-------------|---------|
| Novelty (N) | Yes: Claims | 1-27 |
| | No: Claims | |
| Inventive step (IS) | Yes: Claims | 13-26 |
| | No: Claims | 1-12,27 |
| Industrial applicability (IA) | Yes: Claims | 1-27 |
| | No: Claims | |

2. Citations and explanations

see separate sheet

Re Item V

Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step, or industrial applicability; citations and explanations supporting such statement

1 Reference is made to the following documents:

- D1: US-B-6 401 646 (EDFELDT MICHAEL P ET AL) 11 June 2002 (2002-06-11)
- D2: NL-C-1 016 610 (LANKHORST RECYCLING BV) 16 May 2002 (2002-05-16)
- D3: US-B-6 347 911 (STRANGE ANTHONY E J ET AL) 19 February 2002 (2002-02-19), mentioned in the application
- D4: GB-A-2 153 962 (BRITISH PETROLEUM CO PLC) 29 August 1985 (1985-08-29)
- D5: WO 01/77563 A (LACE DAVID GORDON ;CRP GROUP LTD (GB); SOMERVILLE DAVID MICHAEL RU) 18 October 2001 (2001-10-18)
- D6: GB-A-2 335 248 (CRP GROUP LTD) 15 September 1999 (1999-09-15)
- D9: WO 99/05389 A (CUMING CORP) 4 February 1999 (1999-02-04), mentioned in the application

2 Novelty

None of the documents cited in the search report shows the combination of features of independent claim 1. Therefore the subject-matter of claim 1 and of dependent claims 2-26 and of independent claim 27 is new in respect of the prior art as defined in the regulations (Article 33(2) and Rule 64(1-3) PCT).

3 Inventive Step

The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claims 1-12 does not involve an inventive step in the sense of Article 33(3) PCT.

3.1 With respect to independent claim 1

3.1.1 The document D3 is regarded as being the closest prior art to the subject-matter of claim 1, and shows (see especially figs. 7 and 8; the references in parentheses applying to this document):

A suppression element (41) for **[preventing]** vortex vibrations, comprising an envelope () for at least partly enveloping a tubular element (36); at least one projection (42) pointing away from the envelope **[suitable]** for reducing the formation of vortices on the downstream side of the tubular element, wherein the envelope is modular to form in circumferential direction of the tubular element (36), with similar suppression elements a tube () which, in operation, at least partly envelops a tubular element (36) (...).

- 3.1.2 The subject-matter of claim 1 differs from this known suppression element by at least one spacer **[suitable]** for inhibiting corrosion by maintaining, in mounted condition, an interspace **[suitable]** for fluid flow between the envelope and the tubular element.
- 3.1.3 By maintaining, in mounted condition, an interspace suitable for fluid flow between the envelope and the tubular element helps to inhibit corrosion.
- 3.1.4 The problem to be solved by the present invention may be regarded as providing a suppression element for preventing vortex vibrations that inhibits corrosion by maintaining, in mounted condition, an interspace suitable for fluid flow between the envelope and the tubular element.
- 3.1.5 However, maintaining, in mounted condition, an interspace suitable for fluid flow between the envelope and the tubular element is as such known from document D1 (see col. 5, lines 1-5).

3.2 With reference to claim 2

The additional features of this claim are disclosed in D1 and D4 (cf. especially D1 figs. 3, 4 and col. 4, line 25 - col. 5, line 44).

3.3 With reference to dependent claims 3-12

Dependent claims 3-12 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of novelty and/or inventive step, the reasons being as follows:

- 3.3.1 The additional features of these claims are obvious to the person skilled in

the art or as such known from the cited prior art:

- for claims 3 and 4: see D3 figs. 8-10,
- for claims 5-9: see D2 figs. 1A-1D,
- for claim 10: see D5 fig. 1,
- for claim 11: see D5, claim 1,
- for claim 12: see D5, figs. 1-3, claim 6.

3.3.2 Since all documents D1-D3 and D5 are relating to similar devices from the same technical field and in view of paragraph 3.3 above, the skilled person would regard it a normal design procedure to combine all the features set out in each of claims 3-12, thereby arriving at a suppression element according to each of claims 3-12 without the exercise of inventive skill.

4 With reference to independent claim 27

Though this claim contains a reference to other claims it is nevertheless to be regarded as an independent claim (cf. the Guidelines, 5.19). At least with reference to claims 1-2 this claim does not fulfil the requirements of the PCT with respect to inventive step. It is generally known in the art to produce suppression elements by means of moulds especially when plastic material is used (see e.g. D5, page 6, line 5-11).

CLAIMS

1. A suppression element (1) for vortex vibrations, comprising an envelope (2) for at least partly enveloping a tubular element (100); at least one projection (3) pointing away from the envelope for reducing the formation of vortices on the downstream side of the tubular element,
5 wherein the envelope is modular to form, in circumferential direction of the tubular element (100), with similar suppression elements a tube (101, 102) which, in operation, at least partly envelops the tubular element (100); characterized by at least one spacer (4a-4d) for inhibiting corrosion by maintaining, in mounted condition, an interspace for fluid flow between the
10 envelope (2) and the tubular element (100).
2. A suppression element (1) according to claim 1, further comprising at least one passage (5) in the envelope (2).
3. A suppression element (1) according to claim 2, wherein the passage (5) at least partly extends through the projection (3).
- 15 4. A suppression element (1) according to claim 2 or 3, wherein the passage (5) also forms a passage for a connecting element (9).
5. A suppression element (1) according to any one of claims 2-4, wherein the passage (5) is at a transition between the envelope (2) and the projection (3).
- 20 6. A suppression element (1) according to claim 5, wherein the surface of the projection (3) lies at an angle greater than or equal to 90 degrees to the surface of the envelope (2).
7. A suppression element (1) according to claim 5 or 6, wherein the envelope (2) is unilaterally curved around a longitudinal direction (A) of the
25 suppression element (1).

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8. A suppression element (1) according to claim 7, wherein the envelope (2), transverse to the longitudinal direction (A), is substantially in the form of a circular arc.
9. A suppression element (1) according to claim 8, wherein the envelope (2), seen in the longitudinal direction (A), forms a circular arc of 120 plus or minus 3 degrees, such as, for instance, 118.5 degrees.
10. A suppression element (1) according to any one of the preceding claims, wherein the projection (3) extends in a longitudinal direction (A) of the suppression element (1) and lies at an angle to the longitudinal direction (A).
11. A suppression element (1) according to any one of the preceding claims, wherein the suppression element (1) has one projection (3).
12. A suppression element (1) according to any one of the preceding claims, wherein the projection (3) has a triangular cross-section.
13. A suppression element (1) according to any one of the preceding claims, wherein the projection (3) is open on a side directed toward the envelope (2).
14. A suppression element (1) according to any one of the preceding claims, wherein an interior (22) of the envelope (2), which, in mounted condition, is directed toward the tubular element (100), has a form corresponding to an exterior (21) of the envelope (2), which, in mounted condition, faces away from the tubular element (100).
15. A suppression element (1) according to any one of the preceding claims, further comprising a directing element (6-8) for positioning the suppression element (1) relative to another suppression element.
16. A suppression element (1) according to claim 15, wherein the directing element (6-8) comprises means for positioning the projection (3).
17. A suppression element (1) according to any one of the preceding claims, which is manufactured from a material having a specific density lower than water.

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18. A suppression element (1) according to claim 17, wherein the material has a specific density ranging between 800 and 900 kg/cm³.
19. A suppression element (1) according to any one of the preceding claims, at least partly manufactured from a foamed plastic.
- 5 20. A suppression element (1) according to any one of the preceding claims, at least partly manufactured from reused plastic.
21. A suppression element (1) according to any one of the preceding claims, at least partly manufactured from polyethylene or polypropylene.
22. A suppression element (1) according to any one of the preceding
10 claims, further comprising an origin marking (12).
23. A construction kit for a suppression system, comprising at least two suppression elements (1) according to any one of the preceding claims.
24. A suppression system for vortex vibrations, comprising at least two suppression elements (1) according to any one of claims 1-22, which together
15 form a tube, which, in operation, at least partly envelops a tubular element (100).
25. A suppression system for vortex vibrations according to claim 24, further comprising: a flow element (5) for providing a fluid flow in the space between the tubular element (100) and the suppression elements (1).
- 20 26. An apparatus for extracting minerals, comprising a platform, which is located in or on a water, and at least one pipeline (100), which extends from the platform in the water, a part of the pipeline located in the water at least partly being enveloped by a suppression element (1) according to any one or more of claims 1-22.
- 25 27. A mold for manufacturing a suppression element (1) according to any one of claims 1-22.